orbit defining an orbital plane having a different angle of inclination with respect to the equatorial plane of the Earth, each orbit having a subset of points with sky track over the service area, each sky track having an operating arc corresponding to the region for which each of said pair of satellites operates.

REMARKS

Applicant wishes to thank the Examiner for considering the present application. In the Office Action mailed September 21, 2000, claims 1-18 are pending in the application. Claims 2, 3 and 12 have been canceled. Applicant respectfully requests the Examiner to reconsider the present application as amended above. Applicant has added no new matter to the application by these amendments.

The claims have been amended to clarify the invention. The first clarification is that geosynchronous is further modified with the 24-hour period. The terminology in the art is "24 hour" but the actual period is about 23 hours, 59 minutes. Applicant believes that geosynchronous means having a 24 hour period but to clarify this point for the examiner, these word have been added. Also in claims 8 and 17 the two orbit have angles of inclination that are different. This is clarified in these claims.

Claims 1-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Turner* (5,326,054). Applicant believes the present and previous amendments overcome this rejection.

The present invention has advantages not realized, taught or suggested in the prior art. The present invention provides inclined eccentric geosynchronous orbits for a satellite system that advantageously enables a consistently high elevation angle from a service area. Further, due to the relatively higher altitudes less stationkeeping is required than the *Turner* and *Castiel* references. Claims 8 and 17 specifically recite the coordination of at least two coordinated satellite orbits that are each inclined eccentric and geosynchronous. The angle of inclination of the first orbit and the second orbit relative to an equatorial plane is different to allow satellite coverage to be continuous for a service area. Each of the independent claims are similar and therefore will be discussed together.

The *Turner* reference provides a system of satellites that have ACE orbits. The ACE orbits are elliptical orbits and admittedly *Turner* teaches the potential of inclining the elliptical orbit. However, *Turner* teaches that preferably the orbits are not inclined. As recited in Col. 3, line 34 of the *Turner* reference, "the present invention is any manmade satellite (1) that travels in a certain elliptical orbit. The satellite (1) revolves about the earth five or six times per day. Each of the five or six apogees corresponding to the five or six daily revolutions is positioned above the same longitude of the earth at substantially the same local time-of-day for each day of the year." The *Turner* reference does not teach or suggest the use of geosynchronous orbits that are inclined and eccentric. The *Turner* reference uses satellites that revolve about the earth" five or six times" a day. Geosynchronous satellites revolve once per day, i.e., have a 24 hour period. This point was clarified in the amendments above.

To summarize the above, the Turner reference quite simply does not teach or suggest a geosynchronous orbit. Turner would not be motivated to provide geosynchronous orbit because "by avoiding the geostationary arc, antennas of satellites can be built smaller for the same link budget." Col. 2, lines 51-53. Thus, Turner teaches away from or in the alternative solves the problem in a different way than by using geosynchronous orbits.

Claims 1-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Castiel* (5,845,206). Applicant respectfully requests consideration of this rejection.

The *Castiel* reference as the Examiner points out, discloses an elliptical satellite system which emulates the characteristics of geosynchronous satellites. However, the *Castiel* reference does not provide geosynchronous satellites. As described in several locations in the *Castiel* reference, the satellites employed have less than a geosynchronous period. For example, in Col. 14, line 18-20, 6-hour orbits are described. Other examples of orbits are provided such as in Col. 6, line 54-59. Thus, it is clear that *Castiel* does not contemplate the use of geosynchronous inclined eccentric orbits.

Castiel teaches away from geosynchronous orbit satellites as well. Column 2, lines 10-20 clearly teach that they are trying to avoid such a position. Specifically they refer to the limited geostationary slots. Applicant invention is geosynchronous but not geostationary.

Thus, the *Castiel* and the *Turner* references both teach away from providing a geosynchronous orbit satellite system by providing systems that use relatively low earth orbits and therefore are not geosynchronous. The claims above have been amended to reflect these limitations.

With respect to the dependent claims, namely claims 4-7, 9-16, and 18, each of these claims contains the limitations of their independent claims and are believed to be allowable for the same reasons set forth above.

In light of the above amendments and remarks, applicant submits that all objections and rejections are now overcome. The application is now believed in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments which would place the application in better condition for allowance, he is respectfully requested to call the undersigned attorney.

Respectfully submitted,

Vijayalakshmi D Duraiswamy

Vijayalakshmi D. Duraiswamy
Reg. No. 31,505 11/21/2000

Hughes Electronics Corporation
ES/001/A109
P.O. Box 956
El Segundo, CA 90245-0956

(310) 662-9919

MARKED-UP VERSION OF THE AMENDED CLAIMS:

Claim 1. (Once Amended) A satellite system above a landmass comprising:

a service area on a surface of the earth having a predetermined minimum elevation angle from the horizon;

a satellite having an eccentric, substantially 24-hour period geosynchronous orbit with respect to the earth having sky track when viewed from within said service area, said orbit being inclined relative to an equatorial plane of the earth; and

an operating arc defined by a subset of points on said sky track over said service area, said satellite operating on said operating arc.

Claim 8. (Once Amended) A satellite communications system comprising:

a service area on a surface of the earth having a predetermined minimum elevation angle from the horizon;

a ground station located within said service area;

a first satellite having a first eccentric, substantially 24-hour period geosynchronous orbit with respect to the earth having a first sky track when viewed from within said service area, said first orbit having first inclination relative to an equatorial plane of the earth;

a second satellite having a second eccentric, substantially 24-hour period geosynchronous orbit with respect to the earth having a second sky track when viewed from within said service area, said second orbit having a second inclination different from the first angle of inclination relative to an equatorial plane;

said first satellite having a first operating arc defined by a first subset of points on said sky track over said service area, said first satellite operating within the service area;

said second satellite having a second operating arc defined by a second subset of points on the said second sky track within said service area, said second satellite operating within the service area.

Claim 17. (Twice Amended) A method of providing a system of satellite orbits, the method comprising:

[Specifying] specifying at least one geographic service area within which satellite coverage is to be provided, said service area having a minimum elevation angle thereabove;

[Defining] defining a pair of inclined eccentric, substantially 24-hour period geosynchronous satellite orbits, each satellite orbit defining the orbit, each satellite orbit defining an orbital plane having [an] a different angle of inclination with respect to the equatorial plane of the Earth, each orbit having a subset of points with sky track over the service area, each sky track having an operating arc corresponding to the region for which each of said pair of satellites operates.